

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
Luigi MIGLIARINI et al)
)
Serial No.: Not yet assigned) Group Art Unit: Not yet assigned
)
Filed: June 20, 2001) Examiner: Not yet assigned
)
For: TIRE FOR VEHICLES HAVING A)
HIGH WEAR RESISTANCE AND)
VULCANIZABLE RUBBER)
COMPOSITION FOR MAKING THE)
SAME)

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the above application, please amend this application as follows:

IN THE SPECIFICATION:

Please amend the specification, as follows:

Add two section headings, a section subheading and a paragraph immediately after the title TIRE FOR VEHICLES HAVING A HIGH WEAR RESISTANCE AND VULCANIZABLE RUBBER COMPOSITION FOR MAKING THE SAME, as follows:

--CROSS-REFERENCES TO RELATED APPLICATIONS

--CROSS-REFERENCES TO RELATED APPLICATIONS

This application is a continuation of International Patent Application No. PCT/EP99/10190, filed December 20, 1999, in the European Patent Office; additionally, Applicants claim the right of priority under 35 U.S.C. § 119(a) - (d) based on patent application No. 98204414.1, filed December 22, 1998, in the European Patent Office; further, Applicants claim the benefit under 35 U.S.C. § 119(e) based on prior-filed, copending provisional application No. 60/114,256, filed December 28, 1998, in the U.S. Patent and Trademark Office; the contents of all of which are relied upon and incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention--

Page 1, line 19, delete the subheading "Prior art" and add section subheading --Description of the Related Art-- prior to the start of the paragraph beginning "In the field of vehicle tire manufacturing"

Page 2, line 27, delete the subheading "Summary of the invention" and add section heading --SUMMARY OF THE INVENTION-- prior to the start of the paragraph beginning "The technical problem underlying the present invention"

Page 18, line 3, add section heading --BRIEF DESCRIPTION OF THE DRAWINGS-- prior to the start of the paragraph beginning "Additional characteristics and advantages of the invention"

Page 18, line 11, add section heading --DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS-- prior to the start of the paragraph beginning "With reference to such figure"

Add a new Page 50 after the claims, adding the following ABSTRACT OF THE DISCLOSURE. A new, separate Page 50 including the ABSTRACT OF THE DISCLOSURE is enclosed.

--ABSTRACT OF THE DISCLOSURE

A tire for vehicles includes a tread having a vulcanized polymeric base including at least one reinforcing filler dispersed in the polymeric base; an amount of extractable residue of at least one vulcanization accelerator, containing at least one carbon atom bound to at least two sulfur atoms, from 0.5% to 1.8% by weight based on a total weight of the tread; an amount of at least one activator, expressed as equivalents of zinc oxide, not higher than 2% by weight based on the total weight of the tread; and an amount of combined sulfur lower than 2.5% by weight based on the total weight of the tread. A tread for vehicle tires, a vulcanizable rubber composition for the manufacture of such a tread, and a vulcanizing system, all related to the tire for vehicles, are also disclosed.--

IN THE CLAIMS:

Please cancel, without prejudice or disclaimer, claims 1-34, and add new claims 35-68, as follows:

--35. (new) A tire for vehicles, comprising a tread comprising a vulcanized polymeric base including:

at least one reinforcing filler dispersed in the polymeric base;

an amount of extractable residue of at least one vulcanization accelerator, containing at least one carbon atom bound to at least two sulfur atoms, from 0.5% to 1.8% by weight based on a total weight of the tread;

an amount of at least one activator, expressed as equivalents of zinc oxide, not higher than 2% by weight based on the total weight of the tread; and

an amount of combined sulfur lower than 2.5% by weight based on the total weight of the tread.

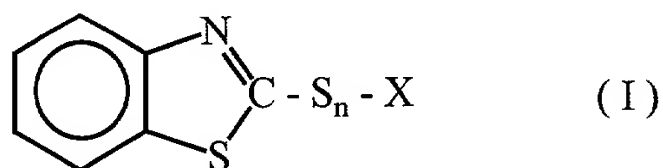
36. (new) The tire of claim 35, wherein the polymeric base is obtained starting from at least one polymer selected from the group comprising: natural rubber; polybutadiene; polychloroprene; polyisoprene; optionally halogenated isoprene-isobutene copolymers; butadiene-acrylonitrile copolymers; copolymers obtainable by polymerization of at least one conjugated diene with at least one vinyl aromatic hydrocarbon; optionally halogenated isobutylene/p-methyl styrene copolymers; styrene-butadiene-isoprene terpolymers, obtained either in solution or in emulsion; ethylene-propylene-diene terpolymers; and mixtures thereof.

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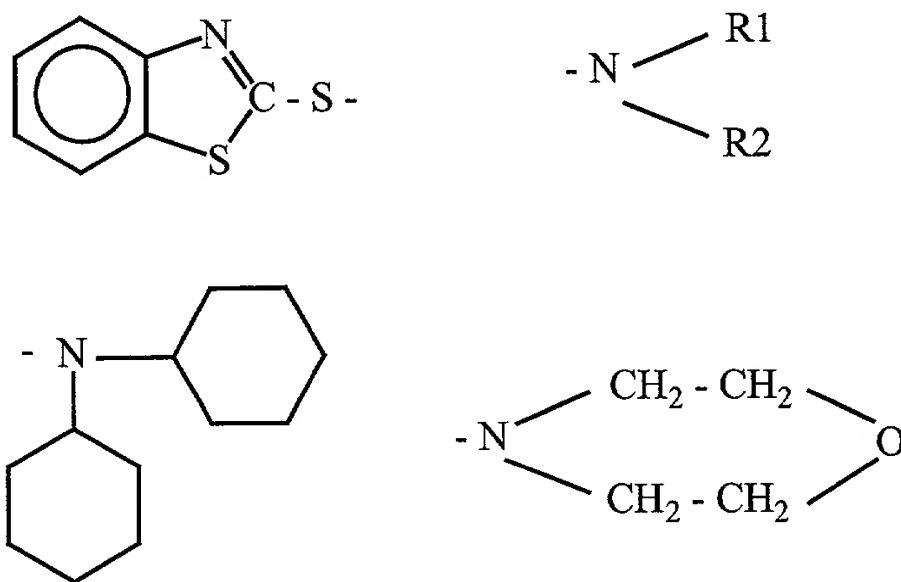
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37. (new) The tire of claim 35, wherein the at least one vulcanization accelerator is selected from accelerators including at least one 2-benzothiazole or sulphenamide group.

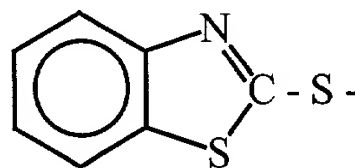
38. (new) The tire of claim 37, wherein the at least one vulcanization accelerator has a following structural formula:



wherein n is an integer from 1 to 5 and X is H or a group selected from:



wherein R1 and R2 are independently H; an alkyl group; a saturated ring optionally comprising C, S, or O; a cycloalkyl group having 5 or 6 carbon atoms; or a group



39. (new) The tire of claim 37, wherein the at least one vulcanization accelerator is selected from the group comprising: 2-mercaptobenzothiazole (MBT), dibenzothiazyl disulphide (MBTS), N-cyclohexyl-2-benzothiazyl-sulphenamide (CBS), N-tert.butyl-2-benzothiazyl

ulphenamide (TBBS), 2-morpholinthia-2-benzothiazole (MBS), N-dicyclohexyl-2-benzothiazyl
sulphenamide (DCBS), benzothiazyl-2-diisopropyl sulphenamide (DIBS), benzothiazyl-2-
tert.amyl sulphenamide (AMZ), morpholine-thiocarbonyl sulphenmorpholine (OTOS), N-
tert.butyl-2-benzothiazol sulphenamide (TBSI), and mixtures thereof.

40. (new) The tire of claim 37, wherein a weight ratio between the amount of
extractable residue of the at least one vulcanization accelerator and the amount of the at least one
activator, expressed in terms of zinc oxide equivalents, is not higher than 10:1.

41. (new) The tire of claim 35, wherein a weight ratio between the amount of combined
sulfur and the amount of extractable residue of the at least one vulcanization accelerator is 1.2:1
to 2.8:1.

42. (new) The tire of claim 35, wherein the at least one activator is selected from the
group comprising: oxygenated compounds of a metal selected from Zn, Bi, or Pb; salts formed
between the metal and a fatty acid, either saturated or unsaturated, having from 8 to 18 carbon
atoms; and mixtures thereof.

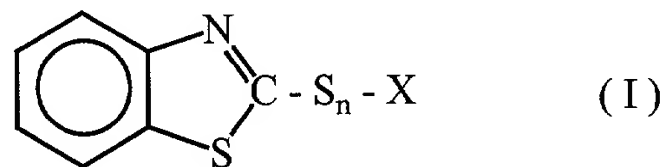
43. (new) The tire of claim 35, wherein the at least one reinforcing filler comprises
carbon black, silica, or carbon black and silica.

44. (new) The tire of claim 43, wherein the at least one reinforcing filler comprises from
0 phr to 100 phr of carbon black and from 0 phr to 100 phr of silica.

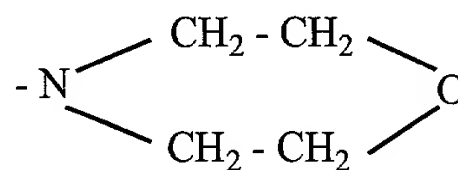
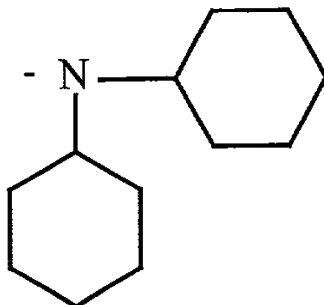
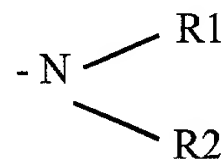
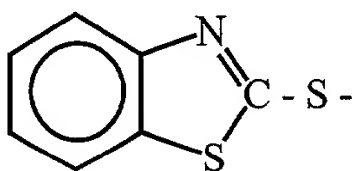
45. (new) A tread for vehicle tires, comprising a vulcanized polymeric base including:
at least one reinforcing filler dispersed in the polymeric base;
an amount of extractable residue of at least one vulcanization accelerator, containing at least one carbon atom bound to at least two sulfur atoms, from 0.5% to 1.8% by weight based on a total weight of the tread;
an amount of at least one activator, expressed as equivalents of zinc oxide, not higher than 2% by weight based on the total weight of the tread; and
an amount of combined sulfur lower than 2.5% by weight based on the total weight of the tread.

46. (new) The tread of claim 45, wherein the at least one vulcanization accelerator is selected from accelerators including at least one 2-benzothiazole or sulphenamide group.

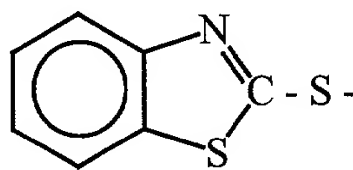
47. (new) The tread of claim 46, wherein the at least one vulcanization accelerator has a following structural formula:



wherein n is an integer from 1 to 5 and X is H or a group selected from:



wherein R1 and R2 are independently H; an alkyl group; a saturated ring optionally comprising C, S, or O; a cycloalkyl group having 5 or 6 carbon atoms; or a group



48. (new) The tread of claim 45, wherein a weight ratio between the amount of extractable residue of the at least one vulcanization accelerator and the amount of the at least one activator, expressed in terms of zinc oxide equivalents, is not higher than 10:1.

49. (new) The tread of claim 45, wherein a weight ratio between the amount of combined sulfur and the amount of extractable residue of the at least one vulcanization accelerator is 1.2:1 to 2.8:1.

50. (new) The tread of claim 45, wherein the at least one activator is selected from the group comprising: oxygenated compounds of a metal selected from Zn, Bi, or Pb; salts formed

between the metal and a fatty acid, either saturated or unsaturated, having from 8 to 18 carbon atoms; and mixtures thereof.

51. (new) The tread of claim 45, wherein the at least one reinforcing filler comprises carbon black, silica, or carbon black and silica.

52. (new) A vulcanizable rubber composition for manufacturing a tread for vehicle tires, comprising:

a cross-linkable unsaturated chain polymeric base; and

a vulcanizing system, comprising:

an amount of sulfur from 0.5 phr to 2 phr;

an amount from 1.5 phr to 7 phr of at least one vulcanization accelerator

containing at least one carbon atom bound to at least two sulfur atoms; and

an amount not higher than 2 phr, expressed in terms of zinc oxide equivalents, of at least one activator.

53. (new) The vulcanizable rubber composition of claim 52, wherein the cross-linkable unsaturated chain polymeric base comprises at least one polymer selected from the group comprising: natural rubber; polybutadiene; polychloroprene; polyisoprene; optionally halogenated isoprene-isobutene copolymers; butadiene-acrylonitrile copolymers; copolymers obtainable by polymerization of at least one conjugated diene with at least one vinyl aromatic hydrocarbon; optionally halogenated isobutylene/p-methyl styrene copolymers; styrene-

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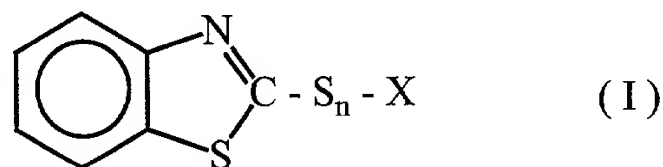
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butadiene-isoprene terpolymers, obtained either in solution or in emulsion; ethylene-propylene-diene terpolymers; and mixtures thereof.

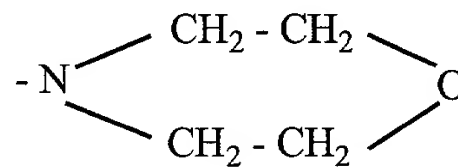
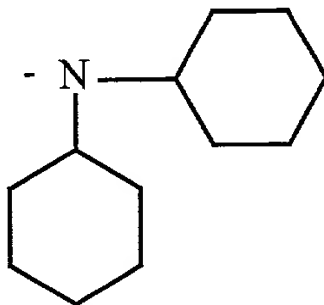
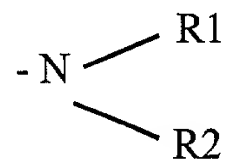
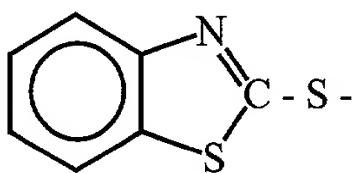
54. (new) The vulcanizable rubber composition of claim 52, wherein the sulfur of the vulcanizing system is provided by elementary sulfur or by at least one sulfur donor selected from the group comprising: dithiobismorpholine, dithiobiscaprolactame, dipentamethylene thiuram tetrasulphide, dialkyldithiophosphate polysulphide, bis-triethoxysilylpropyl polysulphide, alkylphenoldisulphides, and mixtures thereof.

55. (new) The vulcanizable rubber composition of claim 52, wherein the at least one vulcanization accelerator is selected from among accelerators including at least one 2-benzothiazole or sulphenamide group.

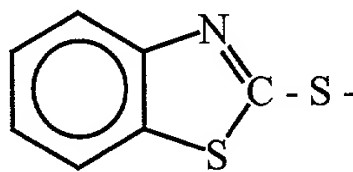
56. (new) The vulcanizable rubber composition of claim 55, wherein the at least one vulcanization accelerator has a following structural formula:



wherein n is an integer from 1 to 5 and X is H or a group selected from:



wherein R1 and R2 are independently H; an alkyl group; a saturated ring optionally comprising C, S, or O; a cycloalkyl group having 5 or 6 carbon atoms; or a group



57. (new) The vulcanizable rubber composition of claim 52, wherein the at least one vulcanization accelerator is selected from the group comprising: 2-mercaptobenzothiazole (MBT), dibenzothiazyl disulphide (MBTS), N-cyclohexyl-2-benzothiazyl-sulphenamide (CBS), N-tert.butyl-2-benzothiazyl sulphenamide (TBBS), 2-morpholinthia-2-benzothiazole (MBS), N-dicyclohexyl-2-benzothiazyl sulphenamide (DCBS), benzothiazyl-2-diisopropyl sulphenamide (DIBS), benzothiazyl-2-tert.amyl sulphenamide (AMZ), morpholine-thiocarbonyl sulphenmorpholine (OTOS), N-tert.butyl-2-benzothiazol sulphenamide (TBSI), and mixtures thereof.

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58. (new) The vulcanizable rubber composition of claim 52, wherein a weight ratio between the amount of sulfur of the vulcanizing system and the amount of the at least one vulcanization accelerator is 0.16:1 to 0.48:1.

59. (new) The vulcanizable rubber composition of claim 55, wherein a weight ratio between an amount of 2-benzothiazole groups coming from the at least one vulcanization accelerator and the amount of the at least one activator, expressed in terms of zinc oxide equivalents, is not higher than 10:1.

60. (new) The vulcanizable rubber composition of claim 52, further comprising at least one secondary vulcanization accelerator selected from diphenylguanidines, dithiocarbamates, thiurams, and mixtures thereof.

61. (new) The vulcanizable rubber composition of claim 60, wherein the at least one secondary vulcanization accelerator is selected from the group comprising: diphenyl guanidine (DPG), zinc dimethyl dithiocarbamate (ZDMC), zinc diethyl dithiocarbamate (ZDEC), zinc dibutyl dithiocarbamate (ZDBC), zinc ethyl-phenyl dithiocarbamate (ZEPC), zinc dibenzyl dithiocarbamate (ZBEC), tetramethylthiuram disulphide (TMTD), tetramethylthiuram monosulphide (TMTM), dimethyl diphenyl thiuram disulphide, and mixtures thereof.

62. (new) The vulcanizable rubber composition of claim 52, wherein the at least one activator is selected from the group comprising: oxygenated compounds of a metal selected

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from Zn, Bi, or Pb; salts formed between the metal and a fatty acid, either saturated or unsaturated, having from 8 to 18 carbon atoms; and mixtures thereof.

63. (new) The vulcanizable rubber composition of claim 52, further comprising at least one reinforcing filler comprising carbon black, silica, or carbon black and silica.

64. (new) The vulcanizable rubber composition of claim 63, wherein the at least one reinforcing filler comprises from 0 phr to 100 phr of carbon black and from 0 phr to 100 phr of silica.

65. (new) A vulcanizing system for vehicle tires, including:

an amount of sulfur from 0.5 phr to 2 phr;

an amount from 1.5 phr to 7 phr of at least one vulcanization accelerator containing at least one carbon atom bound to at least two sulfur atoms; and

an amount not higher than 2 phr, expressed in terms of zinc oxide equivalents, of at least one activator.

66. (new) A process for manufacturing a tire for vehicle wheels, comprising the steps of preparing, around a circumference of a belt structure, a tread of claim 45, and linking, by vulcanization, the tread to the belt structure.

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67. (new) A process for covering a worn tire for vehicle wheels, comprising the steps of preparing, around a circumference of a belt structure, a tread of claim 45, and irreversibly linking the tread to the belt structure.

68. (new) A method for increasing wear resistance of a tire, the tire being provided with at least one carcass ply on which a belt structure is circumferentially applied, and with a tread circumferentially applied around the belt structure and externally provided with a rolling surface suitable to get in touch with the ground, wherein the tire is provided with a tread of claim 45.--

REMARKS

Applicants submit this Preliminary Amendment together with a continuation application under 37 C.F.R. § 1.53(b).

In this Amendment, Applicants add a section heading and an Abstract of the Disclosure to conform to U.S. practice. Additionally, Applicants add claims to the right of priority and benefit. Further, Applicants cancel, without prejudice or disclaimer, claims 1-34, and add new claims 35-68, which include the same subject matter as the original claims, to improve clarity. The originally-filed specification, claims, abstract, and drawings fully support the amendments to the specification and the addition of new claims 35-68. No new matter was introduced.

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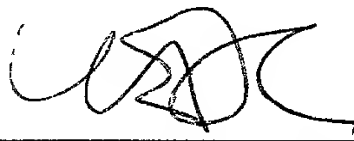
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If there is any fee due in connection with the filing of this Preliminary Amendment,
please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: June 19, 2001

By: 
Lawrence F. Galvin
Reg. No. 44,694

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